

Claims

1. A method of moulding soles of a plastic material, eg polyurethane, and shoe welts on shoe uppers by means of a mould (3) so as to provide the finished shoe with a welted appearance, said mould (3) including a last (2), upon which a shoe upper is arranged, an upper mould part (5) divided along a longitudinal middle plane and thus including two halves (5a, 5b) being laterally movable in relation to a lower mould part (4) between an open and a closed mould position, and a lower mould part (4) being vertically movable in relation to the upper mould part (5) between an open and a closed mould position, **characterised in that**

A - an annular welt (6) is provided having an inner outline substantially corresponding to the outer outline of the lower side section of the shoe upper which corresponds to the position of the welt on the finished shoe,

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B - the welt (6) is placed in the mould in the open position of the mould,

C - the two halves (5a, 5b) of the upper mould part are brought together, whereby an upper projection (15) on each of the halves extends over the welt (6),

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D - the lower mould part (4) is moved into its closed position, a circumferential support face (7, 7') on the upper face of the lower mould part (4) co-acting with a pressure surface (17) on the lower face of the projection (15) on each of the upper mould part halves (5a, 5b) in such a manner that the portion of the welt (6) facing the shoe upper is tilted inwards and downwards to bring the inner end face of the welt (6) into sealing engagement with the lower side section of the shoe upper (1) and

E - the shoe sole is moulded in a manner known *per se* by supplying a plastic material to the cavity of the mould.

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2. Method according to claim 1, **characterised in that** the inner end face of the welt (6) facing the shoe upper (1) has a substantially planar surface (6a) preferably provided with an undercut (6a').
- 5 3. Method according to claim 1 or 2, **characterised in that** such pressure is exerted on the welt (6) by the halves (5a, 5b) of the upper mould part (5) and/or by the lower mould part (4) such that the welt is caused to tilt and the inner end face (6a) thereof is pressed against the shoe upper (1), whereby at least the uppermost 10% of the end face (6a) sealingly abut the shoe upper (1).
- 10 4. Method according to one or more of the claims 1-3, **characterised in that** the support surface (7') is a face of a circumferential recess (21) in the upper face of the lower mould part (4), in a cross-sectional view said face forming an angle α of 20-40°, preferably 25-35°, with the horizontal plane.
- 15 5. Method according to one or more of the claims 1-4, **characterised in that** prior to being placed in the mould the welt (6) is attached along the edge of a relatively thin auxiliary sole (16) which is pervious to the plastic material and assists in keeping the welt (6) in place during the moulding of the sole.
- 20 6. Method according to one or more of the claims 1-5, **characterised in that** the used auxiliary sole (16) is made of a pervious fabric, eg pressed plastic fibres or an adhesive-treated fabric, with a plurality of perforations (11a, 11b, 11c), the diameter of the perforation preferably being 1.5-6 mm and the spacing between the perfora-
- 25 tions preferably being 3-16 mm.
7. Method according to one or more of the claims 1-6, **characterised in that** the welt (6) is made of a comparatively soft material such as leather, rubber, plastics or compressed leather-fibres (lefa).

8. Method according to one or more of the claims 1-7, **characterised in that** the welt (6) is arranged on the circumferential support surface (7, 7') on the upper side of the lower mould part (4) in the open position of the mould.
- 5 9. Method according to one or more of the claims 5-7, **characterised in that** welt (6) is attached to the lower face of the shoe upper (1) via the auxiliary sole (16), preferably by means of an adhesive or by means of centring pins, and brought into engagement with the support surface (7, 7') or received in the recess (21) in the lower mould part (4) during the movement of the lower mould part (4) into its closed
10 position.
10. Shoe welt (6) for use at the method according to one or more of the claims 1-9, **characterised in that** the welt is substantially annular and provided with an inner outline substantially corresponding to the outer outline of the lower side section of
15 the shoe upper at the position of the shoe welt on the finished shoe and that the surface (6a), which is to face the shoe upper, is substantially vertical and optionally provided with an undercut (6a') at least on its lowermost portion.
11. Shoe welt (6) according to claim 10, **characterised in that** it is attached along
20 the edge of an auxiliary sole (16) by means of adhesion or sewing, said auxiliary sole (16) having an outline substantially corresponding to that of a completed moulded sole.
12. Shoe welt (6) according to claim 9 or 10, **characterised in that** its cross-
25 sectional shape corresponds substantially to a trapezium, a rectangle or a rectangle with a short auxiliary lip (27).
13. Mould for use at the method according to one or more of the claims 1-9, said mould including a lower mould part (4) and an upper mould part (5) divided in the
30 longitudinal direction, the two halves (5a, 5b) thereof being laterally movable relative to the lower mould part (4) between an open and a closed mould position and

the lower mould part (4) being vertically movable relative to the upper mould part (5) between an open and a closed mould position, the mould further including a last (2) with an attached shoe upper (1) arranged above the lower mould part, each half (5a, 5b) of the upper mould part (5) being provided with a projection (15), **characterised in that** the mould has a circumferential support surface (7, 7') formed on the upper face of the lower mould part (4) and optionally being formed in a circumferential recess (21) in said upper face, said support face (7, 7') acting to support the welt (6) and preferably upwards inclining towards the lower portion of the shoe upper (1), and that the projection (15) on the lower face of each upper mould half has a forming pressure surface (17) for deforming at least a portion of the welt (6) during closure of the upper mould part and the lower mould part, and further provided with a retaining surface (18) for retaining the welt (6).

14. Mould according to claim 13, **characterised in that** the circumferential recess (21) having a substantially V-shaped cross-section and that at the top the support surface (7') continues into a horizontal top surface for supporting the radially innermost portion of the welt during the moulding of the shoe sole onto the shoe upper, and that the support surface (7') forms an angle α of 20-40°, preferably 25-25°, with the horizontal plane.

15. Mould according to claim 13 or 14 **characterised in that** the width (b) of the projection (15) on each upper mould part half (5a, 5b) has been chosen such that when the mould parts are closed, the edge (17a) of the projection facing the shoe upper 5b) extends beyond the side wall (19) of the lower mould part (4), but prevents an excessive exertion of pressure on the shoe upper (1).

16. Mould according to claim 13, 14 or 15, **characterised in that** at least a portion of the forming pressure surface (17) and of the retaining surface (18) of the upper mould part projection (15) is substantially parallel to the circumferential top face and the support surface (7, 7'), respectively, of the lower mould part.